What is claimed is:

1. An electric motor comprising:

a rotor that is rotated upon energization of the electric motor;

an output shaft that is secured to the rotor to rotate integrally with the rotor;

a circular sensor plate that is secured to the output shaft to rotate integrally with the output shaft;

a stator that has a stator base, which includes a tubular portion, wherein the tubular portion has a shaft hole, and the shaft hole penetrates through the tubular portion in an axial direction of the output shaft and rotatably receives the output shaft; and

a circuit board that is secured to the stator base and includes at least one rotation sensor, which outputs a signal that corresponds to a rotational speed of the sensor plate, wherein each rotation sensor includes two opposed arms, which are spaced from each other in a direction parallel to the axial direction of the output shaft and receives a portion of the sensor plate between the opposed arms, and wherein the circuit board has a tubular portion receiving opening, which penetrates through the circuit board in the axial direction of the output shaft to receive the tubular portion of the stator base and which is elongated in a direction perpendicular to the axial direction of the output shaft, so that at least a portion of an inner peripheral edge of the tubular portion receiving opening is spaced away from

the tubular portion.

2. The electric motor according to claim 1, wherein:

the stator base further includes a base plate, which extends from a base end of the tubular portion in a direction perpendicular to the axial direction of the output shaft;

the base plate has at least one sensor receiving opening, which penetrates through the base plate from a first side to a second side of the base plate in a direction parallel to the axial direction of the output shaft to receive a corresponding one of the at least one rotation sensor, wherein each sensor receiving opening is elongated in a direction parallel to a longitudinal direction of the tubular portion receiving opening of the circuit board;

the tubular portion and the circuit board are located on the first side of the base plate;

the sensor plate is located on the second side of the base plate; and

each rotation sensor protrudes from the corresponding sensor receiving opening on the second side of the base plate to receive the portion of the sensor plate between the opposed arms of the rotation sensor.

3. The electric motor according to claim 2, wherein the tubular portion receiving opening of the circuit board is in a form of an elongated through hole, which penetrates through the circuit board in the axial direction of the output shaft and is

spaced from an outer peripheral edge of the circuit board.

4. The electric motor according to claim 3, wherein:

the base end of the tubular portion has a circular cross section; and

the tubular portion receiving opening is in a form of a racetrack-shaped through hole, which has a first semicircular part, a straight part and a second semicircular part, which are arranged in this order in the longitudinal direction of the tubular portion receiving opening.

5. The electric motor according to claim 3, wherein:

the at least one sensor receiving opening of the base plate includes a plurality of sensor receiving openings; and

the at least rotation sensor includes a plurality of rotation sensors.

6. The electric motor according to claim 5, wherein:

the plurality of sensor receiving openings of the base plate includes two sensor receiving openings, wherein each sensor receiving opening is in a form of an elongated through hole, which penetrates through the base plate in the direction parallel to the axial direction of the output shaft and is spaced away from an outer peripheral edge of the base plate;

the plurality of rotation sensors includes two rotation sensors, which are substantially identical to each other and are arranged in a symmetrical manner with respect to a rotational axis

of the output shaft, wherein each rotation sensor has a generally rectangular cross section that includes two long sides and two short sides, and each short side of the rotation sensor is parallel to the longitudinal direction of the tubular portion receiving opening of the circuit board; and

a length of the tubular portion receiving opening of the circuit board measured in the longitudinal direction of the tubular portion receiving opening is defined as follows:

$X>(R^2-A^2)^{1/2}+W/2+D$

where "X" denotes the length of the tubular portion receiving opening;

"R" denotes an outer radius of the sensor plate;

"A" denotes a minimum distance between the rotational axis of the output shaft and any one of the rotation sensors;

"W" denotes a width of each rotation sensor measured between the two long sides of each rotation sensor; and

"D" denotes an outer diameter of the base end of the tubular portion.

7. The electric motor according to claim 6, wherein:

each sensor receiving opening of the base plate is in a form of a generally rectangular through hole; and

a length of the sensor receiving opening of the base plate measured in a longitudinal direction of the sensor receiving opening is defined as follows:

$Y>(R^2-A^2)^{1/2}+3\times W/2$

where "Y" denotes the length of the sensor receiving

opening.

8. The electric motor according to claim 2, wherein the stator base further includes a frame wall, which is formed along an outer peripheral edge of the base plate on the second side of the base plate and extends in a direction generally parallel to the axial direction of the output shaft to surround the sensor plate and the at least one rotation sensor.

9. The electric motor according to claim 8, further comprising a cover that contacts an axial distal end of the frame wall, which is opposite from the base plate.

10. The electric motor according to claim 8, wherein:

the at least one rotation sensor includes first to third rotation sensors, wherein an angular interval between the first rotation sensor and the second rotation sensor is about 180 degrees, and an angular interval between the third rotation sensor and each of the first and second rotation sensors is about 90 degrees;

the at least one sensor receiving opening of the base plate includes first to third sensor receiving openings;

the first and second sensor receiving openings receive the first and second rotation sensors, respectively;

each of the first and second sensor receiving openings is in a form of an elongated through hole, which penetrates through the base plate in the direction parallel to the axial direction

of the output shaft and is spaced away from an outer peripheral edge of the base plate;

the third sensor receiving opening receives the third rotation sensor;

the third sensor receiving opening is in a form of an elongated recess, which penetrates through the base plate in the direction parallel to the axial direction of the output shaft and is recessed from the outer peripheral edge of the base plate toward the output shaft; and

the frame wall has a lateral opening, which penetrates through the frame wall in a direction parallel to the longitudinal direction of the third sensor receiving opening and is communicated with the third sensor receiving opening.

11. The electric motor according to claim 10, wherein:

the stator base further includes an overhang, which is formed along an axial distal end of the frame wall that is opposite from the base plate, wherein the overhang extends generally in parallel with the base plate from the axial distal end of the frame wall in a direction away from the output shaft; and

the overhang includes a bridge, which closes an axial end of the lateral opening that is opposite from the third sensor receiving opening.

12. The electric motor according to claim 1, wherein:

a base end of the tubular portion has a circular cross section; and

the tubular portion receiving opening is in a form of through hole, which penetrates through the circuit board in the axial direction of the output shaft and has a single semicircular part and a straight part that are arranged in this order in a longitudinal direction of the tubular portion receiving opening.

13. The electric motor according to claim 1, wherein the tubular portion receiving opening of the circuit board is in a form of an elongated recess, which penetrates through the circuit board in the axial direction of the output shaft and is recessed from an outer peripheral edge of the circuit board.

14. The electric motor according to claim 1, further comprising a control means for controlling a rotational speed of the output shaft based on a signal outputted from the at least one rotation sensor.

15. The electric motor according to claim 14, wherein the control means is provided in the circuit board.

16. An electric motor comprising:

a rotor that is rotated upon energization of the electric motor;

an output shaft that is secured to the rotor to rotate integrally with the rotor;

a circular sensor plate that is secured to the output shaft to rotate integrally with the output shaft;

a circuit board that includes at least one rotation sensor, which outputs a signal that corresponds to a rotational speed of the sensor plate, wherein each rotation sensor includes two opposed arms, which are spaced from each other in a direction parallel to an axial direction of the output shaft and receives a portion of the sensor plate between the opposed arms; and

a stator that has a base plate, which extends in a direction perpendicular to the axial direction of the output shaft, wherein the base plate includes:

at least one sensor receiving opening, which penetrates through the base plate from a first side to a second side of the base plate in a direction parallel to the axial direction of the output shaft to receive a corresponding one of the at least one rotation sensor; and

a shaft hole, which penetrates through the base plate in the axial direction of the output shaft and rotatably receives the output shaft, wherein:

the circuit board is located on the first side of the base plate;

the sensor plate is located on the second side of the base plate; and

each rotation sensor protrudes from the corresponding sensor receiving opening on the second side of the base plate to receive the portion of the sensor plate between the opposed arms of the rotation sensor.

17. A manufacturing method of an electric motor, the method

comprising:

installing an output shaft, to which a circular sensor plate is secured, into a shaft hole of a tubular portion of a stator base;

axially installing a circuit board, which has at least one rotation sensor and an elongated tubular portion receiving opening, to the stator base in an axial direction of the output shaft, so that the tubular portion of the stator base is received in the tubular portion receiving opening of the circuit board, and the circuit board is positioned in a non-interfering position; and

moving the circuit board to an installation position toward the output shaft in an imaginary plane perpendicular to the axial direction of the output shaft, so that a portion of the sensor plate is received between two opposed arms of each of the at least one rotation sensor.

18. The method according to claim 17, wherein:

the axially installing of the circuit board includes installing of the circuit board on a first side of a base plate of the stator base, which extends from a base end of the tubular portion in a direction perpendicular to the axial direction of the output shaft; and

the installing of the output shaft into the shaft hole of the tubular portion includes installing of the output shaft into the shaft hole of the tubular portion on a second side of the base plate, which is opposite from the first side of the base plate

in the axial direction of the output shaft.

19. The method according to claim 18, wherein the axially installing of the circuit board further includes installing of each of the at least one rotation sensor into a corresponding one of at least one elongated sensor receiving opening of the base plate.

20. The method according to claim 19, wherein:

the at least one rotation sensor includes a plurality of rotation sensors; and

the at least one sensor receiving opening of the base plate includes a plurality of rotation sensors.